PULL-OUT GUIDE FITTINGS FOR DRAWERS

Background of the Invention

[0001] The invention relates to pull-out guide fittings for drawers or the like, including a drawer-side drawer track, a body-side support track and a center track running between these two tracks on both sides of the drawer. The weight of the drawer between the tracks is transferred via rollers or the like. In particular, the invention addresses the problem of improving the above-described pull-out guide fittings so that when sliding in or fully pulling out the drawer, jarring is avoided or largely reduced.

Summary of the Invention

[0002] The problem according to the invention is solved by providing a damping device operating between at least two of the tracks. The damping device comprises at least two parts that are movable relative to one another.

[0003] The damping device according to the invention can be effective when the drawer is being slid in (when the drawer is completely slid into the body of the furniture item) as well as also when pulling out the drawer (when the drawer reaches its maximum pull-out position). The damping device is preferably a hydraulic damping device. This can be formed by a cylinder with a piston linearly displaceable in the cylinder, or by a rotary damper.

[0004] In the following, various embodiments of the invention will be described in conjunction with the Figures of the attached drawing, in which:

[0005] Fig. 1A is a schematic partial front view of pull-out guide fittings according to the invention, and

Fig. 1B is a detail view of a portion of the pull-out guide fittings shown in Fig. 1A;

Fig. 2 is a plan view from below of the pull-out guide fittings with the drawer open;

Fig. 3 is a plan view from below of the pull-out guide fittings with the drawer closed;

Fig. 4A is a partial front view of a further embodiment of the pull-out guide

fittings according to the invention,

Fig. 5 is a plan view from below of the embodiment of Fig. 4A with the drawer open;

Fig. 6 is a plan view from below of the embodiment of Fig. 4A with the drawer closed;

Fig. 7 is a front view of a further embodiment example of pull-out guide fittings according to the invention,;

Fig. 8 to 12 are plan views from below of the pull-out guide fittings according to the invention, wherein the drawer is shown in the maximum pull-out position, the closed position, and in three intermediate positions;

Fig. 13is a front view of a further embodiment of pull-out guide fittings according to the invention;

Fig. 14 to 18 are plan views from below of the pull-out guide fittings according to the invention, wherein the drawer is shown in the maximum pull-out position, the closed position, and in three intermediate positions;

Fig. 19 is a front view of pull-out guide fittings having a control device between the tracks;

Fig. 20 a plan view from below of these pull-out guide fittings in the maximum pulled out position;

Fig. 21is a plan view from below of these pull-out guide fittings in an intermediate position;

Fig. 22 is a plan view from below of these pull-out guide fittings with the drawer closed;

Fig. 23 is a schematic side view of a further embodiment of pull-out guide fittings according to the invention in the fully pulled out position;

Fig. 24 to 27 are side views of the embodiment of the pull-out guide fittings of Fig. 23 in differing intermediate positions;

Fig. 28 is a side view of the embodiment of pull-out guide fittings of Fig. 23 in the closed position;

Fig. 29A is a sectional detail view of a rotary damper of the preset invention, while Fig.29B is a side view of the rotary damper; and

Fig. 30 is a schematic side view of linear damper of the present invention.

Detailed Description of the Invention

[0006] The embodiments shown relate to an underfloor mounting of the pull-out guide fittings according to the invention. The pull-out guide fittings can, however, also be arranged next to a drawer side wall, and can also be integrally arranged in the drawer frame.

[0007] The pull-out guide fittings according to the invention include on each side of the drawer 1, a support track 3 fastened on a body side wall 2, a drawer track 5 fastened to the drawer bottom 4, and a center track 6 arranged between the tracks 3 and 5.

[0008] The load between track 3 and track 6, and between track 6
and track 5 is transferred in a conventional manner via rolling elements (such as shown in Figures 19A and 29B, the damping device can be a rotary damper component, including a pinion II and a rack 9 rollers and/or sliders).

[0009] In the embodiment shown in Figures 1 to 3, a damping device 7 is supported on the drawer track 5, and the support track 3 includes a stop 8 for stopping the damping device 7, and the stop extends radially from the track.

[0010] When the drawer 1 is closed, a rack 9 of the damping device 7 abuts the stop 8 (see Fig. 3). The rack 9 is provided with a toothed profile 10 which meshes with a pinion 11 of a rotary damper component. when the rack 9 abuts the stop 8, the pinion 11, and thus the rotary damper component, is rotated. In other words, the pinion II is rotated due to the movement of the rack 9 relative to the pinion II that engages rack 9. When the drawer 1 is opened, the rack 9 is brought into its standby position by a compression spring 12, which pushes against the rack 9 (see Fig.2).

[0011] In the embodiment of Figures 4 to 6, the damping device 7 is again supported on the drawer track 5. Stop 8, however, is arranged on the center track 6. The damping device 7 becomes active (i.e., rach 9 moves relative to pinion II, and pinion II rotates) when the center track 6 has reached its most rearward position and rack 9 abuts stop 8.

[0012] In the embodiment of Figures 7 to 12, the damping device 7 according to the invention is supported on the support track 3, and stop 8 is attached to the center track 6. As soon as stop 8 abuts rack 9, the pinion 11 is rotated and the rotary damper component of the damping device 7 becomes active. As in the previous embodiments, compression spring 12 is arranged so that when the drawer 1 is open, the spring 12 presses the rack 9 into a standby position (see Figs. 8 and 9).

[0013] In the embodiment of Figures 13 to 18, the damping device 7 is supported on the center track 6. The damping device 7 is again provided with a rotary damper component, and the pinion 11 of this rotary damper component meshes with two rack 9. In addition, both support track 3 and drawer track 5 are each provided with a stop 8. When closing the drawer 1, both stops 8 act simultaneously upon the damping device 7.

[0014] Between tracks 3, 5, 6, a control component is advantageously arranged so that tracks 5, 6 are moved (like a differential pull-out) relative to track 3, and are also moved relative to one another. In this embodiment, compression springs 12 are also provided which, when the drawer 1 is open, press the traverse 9 of the damping device 7 again into the standby position.

[0015] As shown in Figures 19 to 22, the control component can comprise a friction wheel 13. The friction wheel 13 is supported on the center track 6 and runs on webs of the drawer track 5 and the support track 6 3. A cable control component can also be provided. The control component for the controlling flow of motion of the track can be applied in all embodiments. As illustrated in Figure 19, rollers 14 are arranged between tracks 3, 5, 6.

[0016] Although a rotary damper component has been explained above with respect to Figures 19A and 29B, the damping device 7 can also be a linear damping component including a cylinder 25 with a piston 24 linearly displaceable therein, as shown in Figure 30. The damping medium 22 can be a fluid, for example an oil, a gas or air.

[0017] In the embodiment of Figures 23 to 28, a damping device 7 and a pull-in attachment 15 are positioned at the back end of the support track 3. On the center track 6, a friction wheel 13 (a control component) is supported, which, if appropriate, can also be provided with a toothed rim. At its front end, the center track 6 has a coupling attachment 16, through which the center track 6 can be coupled with the drawer track 5. The coupling attachment 16 comprises a lever connected to the center track 6 so as to be tiltable, and when the lever is in the coupling position it snaps into a hollow 17 of the drawer track 5 (see Figs. 26-28).

[0018] The drawer track 5 has a stop 18 at its front end. At the start of the closing motion, the center track 6 and the drawer track 5 move with respect to one another (i.e., move different amounts), because the friction wheel 13 rests on the friction face 19 and the drawer track 5 is braced (supported) on the friction wheel 13. In other words, as friction wheel 13 rolls on friction face 19 so as to move drawer track 5 and center track 6 inward (toward the closed position) relative to support track 3, drawer track 5 rolls over friction wheel 13 to move further inward relative to center track 6 (see Figs. 23 and 24).

[0019] When the center track 6 and the drawer track 5 have reached the position shown in Figure 24, the friction wheel 13 leaves the friction face 19 and the control action of the friction wheel 13 is discontinued. At this point, the stop 18 of the drawer track 5 abuts the front end of the center track 6 so that the center track 6 is pushed further into the body by the drawer track 5.

[0020] When the center track 6 and the drawer track 5 have reached the position shown in Figure 25, the coupling attachment 16 abuts the front end of the support track 3 or the friction face 19, and is thus tilted into the perpendicular position so that it snaps into the hollow 17 of the drawer track 5 (see Fig. 26). The drawer track 5 is thereby coupled with the center track 6 and the two tracks 5, 6 are jointly moved further in the closing direction. Subsequently, as can be seen in Figure 26, the stop 8 of drawer track 5 abuts the rack 9 of the damping device 7, and the push-in motion of the drawer is decelerated.

[0021] After the drawer 1 has been pushed in further, coupling of the center track 6 with the pull-in attachment 15 occurs, wherein the pull-in attachment 15 engages a coupling part 20 of the center track 6. The center track 6, together with the drawer track 5, is then pulled into the end position shown in Figure 28, wherein this motion is damped by the damping device 7. As a result a highly quiet running-in of the drawer into the furniture body takes place.

[0022] When pulling out the drawer 1, first the drawer track 5 remains coupled with the center track 6 and these tracks 5 and 6 are moved together outwardly, until the friction wheel 13 runs onto the friction face 19 and the differential motion of the tracks 5, 6 results. Instead of the drawer track 5, center track 6 can also abut the damping device 7.